NTT

Innovative R&D by NTT

LCOO Member update & Priorities NTT 2018

8th May 2018
NTT Software Innovation Center

NTT R&D focus area for Open Infrastructure development

Leveraging open technologies for flexible and smart infrastructure.

IT systems Infrastructure

- Cutting Edge Cloud technologies
  - OpenStack
  - K8S, Serverless

- Automation technologies
  - Ansible, StackStorm, OpenConfig, etc

Network systems Infrastructure

- Open standards/Open interfaces
  - ETSI NFV, MEC
  - TIP

- Adopting Cloud technologies
  - OpenStack/OPNFV
  - Edge Computing

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Current Technical Area of Interest

- Standardized Software Stack for Service Infrastructure
  - For IT Systems (Private/Public Cloud)
    - OpenStack+K8S for cloud on-boarding
  - For Network systems (Transport, Service servers)
    - OpenStack for NFV workloads

- DC-wide automation
  - Automation and CI/CD including network appliances
  - Use of AI technologies

- Edge/Fog architecture for IoT/5G
  - Use of FaaS/Serverless technologies for efficient resource management

OpenStack upstream activities (Update)

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Project	Description	Key activities	Next steps
Masakari	An official OpenStack project which provides high availability for VMs. Masakari provides automatic restart of VMs on failures such as compute node failures. Targeted for legacy stand alone servers.	• Become an official project (Done) • HA for Bare Metal (Ironic integration)	• Include into distribution packages (Suse:done, Red Hat: working)
Neutron	Upstreaming new features required for NTT group companies	• Core reviewer for project maintenance • SPP for fast VM-VM communication (Done)	• Improve SPP driver
Nova	Upstreaming new features required for NTT group companies	• Bug fixes • Improve performance for NFV (SR-IOV/ DPDK operational issues) • Flexible CPU pinning	• Add testing scenario for Cells v2 • Add testing scenario for Resource provider • Forum discussion on SR-IOV/DPDK • BP for flexible CPU pinning
QA	OpenStack testing project (Eris)	• Add extreme testing framework to upstream testing framework (Eris). • Working with AT&T, Intel and QA team • Now an official sub-project under QA team	• Finalize architecture • Unifying solutions from various companies into Eris
Swift	Object storage	• Core reviewer for project maintenance	
Storlets	Compute within object storage	• PTL • Promote project for wider adoption	

NFV related activities

Congress	Policy engine/enforcement	• Improve scalability • Integrate with OPNFV Doctor project	• Production release of OPNFV Doctor
Blazar	An official OpenStack project which provides time-based resource reservation for tenants. It currently provides host reservation. Collaborative work with OPNFV Promise project.	• Become an official project (Done) • Instance reservation (Done) • Horizon, Tacker/Heat integration	• Improve stability and operability

Next steps for LCOO

- **<u>Maturing OpenStack</u>**
  - Upgrade, Community LTS
  - Enhance Testing Framework (Eris), Enhance resiliency (auto-healing, HA)
  - Maturing new core features (Resource Provider, PlacementAPI, Cellsv2)

- **<u>OpenStack+K8S Integration</u>**
  - Architecture for VM/Container/Baremetal hybrid environment. (e.g. K8S on OpenStack, Side-by-side)
  - OpenStack control plane on K8S (on-going work by AT&T and SKT)

- **<u>Filling the gap between NFV requirements and OpenStack</u>**
  - Solving Requirements from NFV (i.e. Blazar, Nova)
  - Data plane acceleration technology enhancements (Ops perspective)
  - Towards cloud native NFV